



Project Number

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Development of Minimum Standards for Event-based Data Collection Loggers and Performance Measure Definitions for Signalized Intersections

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Current Situation

New traffic signal controllers, which have advanced data collection abilities, offer better information about the response of traffic signal timings to traffic flows. However, traffic engineers need more than raw data. The controllers must be set up to record meaningful events in order to establish performance measures. The Florida Department of Transportation (FDOT) sought analysis and recommendations regarding the capability of these new controllers and their potential for use with automatic signal performance measurement system software.

Research Objectives

Florida Atlantic University researchers investigated the capabilities and features of six different signal controllers to determine the minimum standards that these controllers must meet to be approved for use in Florida. The overall performance of the controllers was also evaluated.

Project Activities

The researchers tested six controllers using hardware-in-the-loop simulation, in which the traffic controller (the hardware) interacts with a computer simulation of traffic behavior. The computer provides traffic information to the controller, and the controller's responses are monitored and correlated with the traffic behavior. First, controllers were tested separately using data from the same intersection. Then, they were tested simultaneously, using identical intersection geometries.

Analysis and evaluation of the controller tests revealed a minimum set of event-based data codes that could be used in standard FDOT specifications for signal controllers. Comparison of the controller data with the traffic simulations provided a test of data quality and defined a set of scenarios that can be used to test faults in the system.

Current performance measures were reviewed, and their definitions revised in light of study results. Work by other researchers was examined to identify possible traffic signal performance measures. Additional performance measures and modifications of current measures were suggested. These changes have the possibility of significant improvements in the accuracy and meaning of measuring performance on signalized arterials.

Expanding the existing automatic signal performance measurement system software for statewide implementation was also investigated. The calibrated and validated traffic simulation model used to test the controllers was documented with clear instructions regarding setup of each of the tested controllers. The entire setup was delivered to the FDOT Traffic Engineering Research Laboratory (TERL), and training for TERL staff was conducted.

Project Benefits

The capabilities of new traffic controllers offer the possibility of better management of traffic flows. In the short term, this can produce a more efficient roadway system, and in the long term, better transportation planning.

For more information, please see www.fdot.gov/research/.



A worker accesses a traffic signal control cabinet.